SECTION 3:
AIRPORT FACILITY REQUIREMENTS

GILA BEND MUNICIPAL AIRPORT
AIRPORT MASTER PLAN 2003

GENERAL REQUIREMENTS AND CRITERIA

Any growth in local aviation related activities or change in existing or anticipated use of an airport facility requires a corresponding program of airport development and implementation. This is necessary in order to assure that the facility remains able to effectively accommodate its demand and to effectively serve its market. In order to provide for the demands on the Gila Bend Municipal Airport, a schedule of facility improvements has been developed, based on an inventory of the existing airport facilities and the development of forecast aircraft activity through the twenty-year planning period.

The recommendations for each of the airside and landside facilities were developed accepting the following criteria:

< The dimensional standards and design criteria for all improvements proposed within the planning period shall be as detailed in FAA Advisory Circular AC 150/5300-13, Airport Design and the Arizona Department of Transportation's (ADOT) Transportation Board Policies, 1998 Edition. A printout from the FAA's Airport Design program is included at the end of this section (pages FAA-1 through FAA-4). Excerpts from the ADOT Transportation Board Policies is also included (see pages ADOT-1 through ADOT-3). This includes criteria for the existing and ultimate airport configurations.

< The existing critical aircraft is a mix of ARC B-I and B-II piston single and twin engined types, and some ARC B-II jets and turboprops, as detailed in Section 2. The airport's reference code is currently ARC B-II. Immediate and Short Term improvements should be designed to serve ARC B-II aircraft, with consideration for possible future expansion within the planning period to serve an increase in activity by larger and/or heavier ARC B-II aircraft. Additional recommendations are given for expansion to serve larger ARC C-II business jets in the future.

FACILITY REQUIREMENTS RECOMMENDATIONS:

Introduction:

The following narrative contains a discussion of each recommended item of development.

The discussion of each element includes recommendations for improvements to meet the Short Term (2003-2008), the Intermediate Term (2009-2013), and the Ultimate Term (2014-2023) demand. The Ultimate Term program includes alternate recommendations for potential expansion of the airport to serve a range of ARC C-II business aircraft. Recommendations for action in a subset of the Short Term, the Immediate Term (2003-2004) are also included when a deficiency has been defined which requires immediate correction for reasons of safety, or when a feature was found to be not able to fulfill its design function at the present levels of demand.

Summary tables for the recommended improvements in the Short Term, Immediate Term subset, Intermediate Term, and Ultimate Term (and options) are included at the end of this section.

Instrument Approaches and Navigational Aids:

The Gila Bend Airport is equipped with an FAA-owned and operated VORTAC (VHF Omni-Directional Range Tactical Air Navigation station). Currently there are no published instrument approaches to the Gila Bend Airport. A GPS-4 approach is recommended in the November, 1998 edition of the "Navigational Aids And Aviation Services Special Study", prepared by the ADOT-Aeronautics Division (see Table 5-6, page 5-61 of the ADOT study).

Recommendations:
Due to the minimal use of the airport and the abundance of visual flying weather, a published instrument approach is not recommended unless it were to be established primarily as a training facility to relieve some of the congestion in the Phoenix metropolitan area. This approach is included in the ultimate term recommendations.

Primary Runway Requirements:

The existing runway (Runway 4/22) is 5,200' long and 75' wide. See **Figure 1-1** in Section 1 for a detailed description of its composition.

The previous section (Section 2: Forecasts of Aviation Activity) indicated that the available runway length of 5,200' is adequate to accommodate many single and twin engined piston aircraft and some small business jets and turboprops with takeoff weights of up to 12,500 pounds.

The analysis included in Section 2 suggests that a reasonable mix of 30,000 pound-or-less aircraft through ARC B-II could also be accommodated by the 5,200' long runway, and that many more of these types could be accommodated by a 6,500' long runway (a 1,300' extension).

The FAA's AC 150/5325-4A, Runway Length Requirements for Airport Design recommends the following runway lengths for an airport at an altitude of 781' MSL, with a mean daily maximum temperature of 110E Fahrenheit (as calculated using the FAA's Airport Design computer software):

FAA AC 150/5325-4A
Primary Runway Length Recommendations
for Gila Bend Municipal Airport

Small airplanes (12,500 pounds or less):	
with approach speeds of less than 30 knots	320 feet
with approach speeds of less than 50 knots	860 feet
Small airplanes (12,500 pounds or less) with less than 10 passenger seats:	
75 percent of these small airplanes	3,000 feet
95 percent of these small airplanes	3,550 feet
100 percent of these small airplanes	4,220 feet
Small airplanes with 10 or more passenger seats	4,760 feet
Large airplanes of 60,000 pounds or less:	
75 percent of these large airplanes at 60% useful load	5,350 feet
75 percent of these large airplanes at 90% useful load	8,720 feet
100 percent of these large airplanes at 60% useful load	7,320 feet
100 percent of these large airplanes at 90% useful load	11,150 feet

Examination of the above table suggests that the Section 2 analysis of critical aircraft mix is supported by the FAA criteria. According to the FAA, 100% of small aircraft (those that are 12,500 pounds or less) would be accommodated by the existing 5,200' runway. This utilization would be increased to also accommodate 75% of large aircraft with takeoff weights of up to 60,000 pounds, operating at reduced loads, with the addition of a runway extension to 6,500'.

Runway 4/22 is structurally sound and has been classified as Good, meaning that it is substantially adequate throughout the 20-year time frame of this study, assuming only normal maintenance. The design pavement strength is for 12,500 pound Single Wheel Gear (SWG) aircraft. Although the actual strength probably exceeds the design strength, the pavement will need to be strengthened in the future if larger business aircraft are to be accommodated.

FAA criteria recommends a 75' pavement width for ARC B-II runways. This must be widened to 100' for runways with approach visibility minimums lower than 3/4 mile. The recommended ultimate approach is a non-precision procedure with visibility minimums of not less than 3/4 mile. Therefore, the 75' pavement width is adequate. If larger ARC B-II aircraft are accommodated in the future, Runway 4/22 should also be extended to a total length of 6,500 feet.

Land use within the approach to Runway 22 is controlled through a lease on a parcel of land that encompasses the RPZ. The land is State Trust Land and the Town pays an annual lease to the State Land Department. This land should be acquired in fee.

A portion of the Runway 4 RPZ is controlled by an existing Avigation Easement over State Trust Land. This parcel should also be acquired in fee and the property line fencing should be relocated.

Short Term - Immediate Term Subset Recommendations:
Acquisition of RPZ land is planned to take place in 2004, as part of a future FAA grant.

Short Term Recommendations:
A crack seal/Slurry Seal treatment and restriping should occur in 2007.

Intermediate Term Recommendations:
Consideration should be given to strengthening the runway pavement to 30,000 pound SWG and extension of the runway to 6,500'. This should be programmed for the Intermediate Term, but not constructed unless it is demonstrated that a significant increase in larger B-II aircraft is imminent or actually occurring.

Ultimate Term Recommendations:
Runway 4/22 should be scheduled for a crack seal/Slurry Seal treatment and restriping in 2013.

Optional Ultimate Term Recommendations:
The Ultimate Term should include planning for expansion of the airport to serve

ARC C-II business jets. This option may include strengthening Runway 4/22 to 60,000 pound SWG. If this optional improvement is not made, a crack seal/Slurry Seal treatment and restriping should occur in 2018.

Crosswind Runway Requirements:

Section 1 of this report includes a summary of the prevailing wind conditions that occur at Gila Bend. The FAA recommends a minimum wind coverage of 95%. If a single runway cannot meet this criteria, a crosswind runway is recommended, aligned such that the total combined wind coverage for the two runways will be at least 95%.

The wind analysis described in Section 1 indicated that the existing Runway 4/22 provides 98.58% crosswind coverage for the ARC B-II 13-knot threshold, well above the FAA's requirement of 95%. Therefore, a crosswind runway is not recommended.

Taxiways:

The parallel Taxiway A and the Connector Taxiways (B through G) are structurally sound and their surfaces are classified as Fair to Good. They should be substantially adequate throughout the 20-year time frame of this study, assuming only normal maintenance. However, the taxiway pavements will require strengthening if the runway design strength is upgraded.

The existing taxiways are 35' wide. Parallel Taxiway A is located 240' from the Runway 4/22 centerline. This is in compliance with FAA minimum standards for an ARC B-II or C-II airport with approach visibility minimums of not lower than 3/4 mile.

Short Term Recommendations:
A maintenance crack seal/Slurry Seal treatment and restriping should occur in 2007.

Intermediate Term Recommendations:
If the runway pavement is strengthened to 30,000 pound SWG and extended to 6,500', the taxiways should also be strengthened. This should be programmed for the Intermediate Term, concurrent with the runway project, but not constructed unless it is demonstrated that a significant increase in larger B-II aircraft is imminent or actually occurring.

Ultimate Term Recommendations:
The taxiway pavement should be scheduled for a crack seal/Slurry Seal treatment

and restriping in 2013.

Optional Ultimate Term Recommendations:
The Ultimate Term should include planning for expansion of the airport to serve ARC C-II business jets. This will include strengthening the taxiway pavements to 60,000 pound SWG concurrent with runway pavement strengthening. If this improvement is not made, a crack seal/Slurry Seal treatment and restriping should occur in 2018.

Helicopter Operation Area:

Helicopters from Arizona Game & Fish Department and the United States Army Corps of Engineers, Bureau of Land Management and Bureau of Reclamation utilize the airport from time to time. Rotorcraft operations currently use the existing aircraft parking area or the connecting taxiway to the runway for landings and departures. Because of the low volume of use at this time, this practice has continued without incident.

Short Term Recommendations:
In order to provide a safer environment, it is recommended that a marked and lighted helicopter takeoff and landing pad and tiedown areas be constructed. The proposed construction should utilize Portland Cement Concrete for the landing pad.

Aircraft Parking and Storage Requirements:

The airport currently has a 240' x 700' aircraft parking apron that was completely reconstructed in 2002. The taxiway areas are constructed of AC pavement and the aircraft parking areas are of PCC pavement. The apron has tiedowns to accommodate 35 aircraft. The tiedowns were found to be in good condition, and the apron pavement surface is classified as Good.

The number of required tiedown spaces for based and transient aircraft use was determined by applying the following criteria and assumptions.

< Approximately 88% of the total peak daily operations are assumed to be by transient aircraft at the present time. This percentage is forecasted to remain the same through 2023.

< Most visiting aircraft will arrive and depart on the same day. The actual number of peak transient aircraft is assumed to be one-half the peak transient daily operations.

< Seventy-five percent of the transient aircraft will be parked on the apron at the same time during the peak period.

< Fifty percent of the based aircraft may also be parked on the apron temporarily or seasonally.

The following calculations were made to derive the recommended number of tiedown spaces to be provided on the parking apron in the present and ultimate scenarios.

Where: D = Average Daily Peak Operations.
T = Total daily peak transient operations.
N = Number of required tiedowns for transients.
B = Number of based aircraft.
...and
S = Total number of recommended tiedowns.

For base year (2003) condition:
T = D (0.88) = 30(0.88) = 26.4=**26**
N = (T/2) 0.75 = (26/2)0.75 = 9.75
N = **10**
S = (0.50) (B))+N = (0.50) (3)+10 = 11.5 =**12**

For Ultimate (2023) condition:
T = D (0.88) = 66(0.88) = **58**
N = (T/2)0.75 = (58/2)0.75 = 19.5
N = **20**
S = (0.50 (B))+N = (0.50(7)+20 = 23.5=**24**

The existing aircraft parking apron's available number of spaces will be adequate to meet the needs throughout the twenty-year planning period.

The Aircraft Parking Apron's pavement was designed to accommodate 12,500 pound SWG aircraft. If the runway and taxiways are strengthened to serve larger aircraft, the Apron will need to be strengthened accordingly. This strengthening may be limited to a designated Large Aircraft Parking Area.

The existing Hangar/Shade will accommodate 2 aircraft. The existing Private Hangar structure will accommodate 1 aircraft. In the above estimates, it is assumed that most based aircraft owners will prefer to park their aircraft within a hangar or T-Shade, if available at a reasonable cost. For this reason, adequate land area for hangar and/or shade construction should be provided for all forecast

based aircraft through the planning period (16 based aircraft by 2023). Hangars may be constructed as required by private interests upon leased land, or by the Town to provide a revenue-producing rental base. Shaded parking should be considered a priority because of the extreme summer weather experienced in Gila Bend.

Short Term - Immediate Term Subset Recommendations:
Adequate land should be set aside for future hangar development. This is a function of this planning document.

Short Term Recommendations:
Lighted T-Shades should be constructed over the existing 8 aircraft tiedown spaces on the northwest portion of the apron. The Apron pavement should be scheduled for a crack seal/Slurry Seal treatment and restriping in 2007.

Intermediate Term Recommendations:
A designated Large Aircraft Parking Area should be strengthened to accommodate 30,000 pound ARC B-II aircraft concurrent with the strengthening of runway and taxiway pavements. The Apron pavement should be scheduled for a crack seal/Slurry Seal treatment and restriping in 2013.

Ultimate Term Recommendations:
The Apron pavement should be scheduled for a crack seal/Slurry Seal treatment and restriping in 2018. Lighted T-Shades should be constructed over the remaining existing tiedown spaces.

Optional Ultimate Term Recommendations:
The designated Large Aircraft Parking Area should be strengthened to accommodate 60,000 pound SWG aircraft concurrent with upgrade to ARC C-II design standards.

Terminal Building Requirements:

The Estimated Peak Hourly Demand, as established in Section 2, was used to arrive at an estimate of the required Terminal Building area for the anticipated general aviation demands through the planning period. A basic criteria of 50 square feet of building space per peak hour passenger or pilot was applied to the assumed rate of 2.5 occupants per peak hour aircraft.

Using this criteria, the estimated minimum recommended Terminal Building space is as follows:

Existing (2003) Condition: (50) (3) (2.5) = 375 square feet

Ultimate (2023) Condition: (50) (7) (2.5) = 875 square feet

The existing terminal building/office, containing 600 square feet, is adequate to meet the present demand. However, if projected demand reaches the anticipated level, the building will require expansion. The existing building includes an electrical equipment vault, storage room, two restrooms, and a pilot lounge area. The building could be expanded to include an Airport Manager's office and additional pilot and passenger amenities.

Short Term - Immediate Term Subset Recommendations:
The interior appurtenances of the Terminal Building are in Poor condition and should be upgraded and maintained in a clean and good working order. The Terminal Building roof is in Poor condition and should be repaired to prevent interior and structural damage.

Ultimate Term Recommendations:
The Terminal Building should be expanded to a minimum of 875 square feet.

Automobile Parking and Access Requirements:

A graded dirt access road leads from the highway to the fenced boundary of the terminal area. There are no designated parking spaces in the existing graded dirt auto parking area. The area of the graded parking area is approximately 100' x 150', or approximately 1,667 square yards.

The Estimated Peak Hourly Demand was also used as a basis to estimate the projected requirements for automobile parking. The criteria used is a factor of 3.25 automobiles per peak hour operation. This factor allows for 2.5 occupants per aircraft operation during the peak hour, plus allowance for airport employees and visitors.

The estimated automobile parking requirements are as follows:

Existing (2003) Condition: (3.25) (3) = 9.75 = 10 parking spaces

Ultimate (2023) Condition: (3.25) (7) = 22.75 = 23 parking spaces

Short Term Recommendations:
Due to the regular maintenance required for the dirt access road, it is recommended that the road be paved. It is also recommended that a paved auto

parking area be developed with designated spaces (10 spaces including 2 for handicapped use).

Intermediate Term Recommendations:
Security lights should be installed along the Access Road and in the Automobile Parking Area at a time when this is convenient (for example, in conjunction with other electrical improvements). The Access Road and Automobile Parking Area pavement should be scheduled for a crack seal/Slurry Seal treatment and restriping in 2007.

Ultimate Term Recommendations:
The paved automobile parking area should be expanded to accommodate a total of 23 cars within the Ultimate Term. Parking area security lighting should also be expanded. The Access Road and Automobile Parking Area pavement should be scheduled for a crack seal/Slurry Seal treatment and restriping in 2013 and 2018.

Airport Visual Aids:

The existing airport beacon, guidance signage, and Medium Intensity Runway Lights are in good condition and adequate for this airfield's present demand. No upgrades are recommended for these lighting systems. However, additional guidance signage and extension of the edge lighting will be required in conjunction with the recommended runway extension.

The airport does not currently have a visual approach path indicator system (VASI or PAPI) which aids a pilot in determining the approaching aircraft's position on the glide path.

Short Term Recommendations:
A Precision Approach Path Indicator (PAPI) installation for Runways 4 and 22 are recommended for the Short Term.

Intermediate Term Recommendations:
Extension of Runway 4/22 and Taxiway A will require extension of the runway and taxiway edge lighting systems (MIRL / MITL), as well as installation of additional guidance signage. Distance Remaining signage should also be installed at this time. Relocation of the PAPI system at the extended runway end will also be required.

Ultimate Term Recommendations:
A Runway End Indicator Light (REIL) installation for Runways 4 and 22 are recommended for the Ultimate Term.

Segmented Circle & Wind Cone

The lighted segmented circle and wind cone are in Good condition. No improvements are recommended to the existing system, beyond normal maintenance. However, auxiliary wind cones should be installed at each runway end as an enhancement to operational safety.

Intermediate Term Recommendations:
Lighted auxiliary wind cones should be installed at each runway end concurrent with the runway extension project.

Aircraft Fuel Service:

The Gila Bend Airport has been without a fuel system since 1997. The existing fuel above ground tank is not operational and cannot be effectively purged of diesel fuel.

Short Term Recommendations:
It is recommended that an above-ground fuel system package be installed for 100LL and Jet-A fuel. A new raised fuel island was constructed on the aircraft apron in 2002. Conduits for future electrical and telephone circuits were also installed.

Fencing:

The existing Terminal Area fencing was constructed of 3" steel tubing at a height of 4', which does not conform to FAA standards for security. The FAA recommends a 7' chain-link fence with 3 rows of barbed wire along the top. The 4 stranded barbed wire property line fencing is in Fair to Poor condition. Consideration should be given in the future to upgrading the property line fencing to chain-link. Approximately 2,250 linear feet of fence crosses the Runway Protection Zone (RPZ) of Runway 4 and should be removed.

Short Term - Immediate Term Subset Recommendations:
The existing fence crossing the RPZ of Runway 4 should be relocated after the acquisition of the RPZ (under a future FAA grant).

Short Term Recommendations:
The Terminal Area Security Fencing should be upgraded to 7' chain-link to increase the integrity of airport security.

Intermediate Term Recommendations:
The property line fencing should be replaced with 7' chain-link.

Utilities:

The utilities including water, electricity, telephone, propane gas, and sanitary sewer are all in Good condition and adequate for the present demand. However, utilities should be extended and upgraded to meet future demand as new facilities are constructed.

General Development Plan:

The following tables are a summary of the general recommendations for facility improvements to be constructed within each of the time frames presented above.

Alternate methods for execution of the recommended major improvements are presented in Section 4, Development Alternates.

Estimated costs for the recommended development will be presented in Section 7: Financial Plan.

GENERAL DEVELOPMENT PLAN - Gila Bend Municipal Airport - Gila Bend, Arizona
SHORT TERM - IMMEDIATE TERM SUBSET (2003-2004)

ITEM	RECOMMENDED IMPROVEMENT
1. Instrument Approaches and Navigational Aids	None.
2. Primary Runway (Runway 4/22)	Acquire land for Approach Protection (Runway 4 and 22 RPZ's)
3. Crosswind Runway	None.
4. Taxiways	None
5. Helicopter Operation Area	None.
6. Aircraft Parking and Storage Requirements	Set aside adequate land for future hangar development.
7. Terminal Building Requirements	Upgrade interior appurtenances. Repair Roof
8. Automobile Parking and Access Requirements	None.
9. Airport Visual Aids	None
10. Segmented Circle & Wind Cone	None.
11. Aircraft Fuel Service	None.
12. Fencing	Relocate existing fence crossing the RPZ of Runway 4 after the fee acquisition of the Runway Protection Zone (scheduled for 2004 under a future FAA AIP grant)
13. Utilities	None.

GENERAL DEVELOPMENT PLAN - Gila Bend Municipal Airport - Gila Bend, Arizona
SHORT TERM (2005-2008)

ITEM	RECOMMENDED IMPROVEMENT
14. Instrument Approaches and Navigational Aids	None.
15. Primary Runway (Runway 4/22)	Crack Seal / Slurry Seal and Restriping (2007 maintenance project).
16. Crosswind Runway	None.
17. Taxiways	Crack Seal / Slurry Seal and Restriping (2007 maintenance project).
18. Helicopter Operation Area	Construct a Lighted PCC Helipad and paved Rotorcraft Parking Area.
19. Aircraft Parking and Storage Requirements	Construct Lighted T-Shades over existing tiedown spaces. Crack Seal / Slurry Seal and Restriping (2007 maintenance project).
20. Terminal Building Requirements	None.
21. Automobile Parking and Access Requirements	Construct a Paved Automobile Parking Area to accommodate 10 cars. Pave the existing Access Road.
22. Airport Visual Aids	Install PAPI systems on Runway 4 and 22 approaches.
23. Segmented Circle & Wind Cone	None.
24. Aircraft Fuel Service	Install 100LL and Jet-A package storage and delivery system.
25. Fencing	Upgrade Terminal Area Fencing to 7' chain-link to increase airport security.
26. Utilities	None.

GENERAL DEVELOPMENT PLAN - Gila Bend Municipal Airport - Gila Bend, Arizona
INTERMEDIATE TERM (2009-2013)

ITEM	RECOMMENDED IMPROVEMENT
27. Instrument Approaches and Navigational Aids	None.
28. Primary Runway (Runway 4/22)	Acquire land for runway extension. Crack Seal / Slurry Seal and Restriping (2013 maintenance project). Extend Runway 4/22 to 6,500' (1,300' extension). Strengthen Runway 4/22 pavement to 30,000 pound SWG design.
29. Crosswind Runway	None.
30. Taxiways	Extend Taxiway A to 6,500' (1,300' extension). Crack Seal / Slurry Seal and Restriping (2013 maintenance project). Strengthen all taxiway pavements to 30,000 pound SWG design.
31. Helicopter Operation Area	None.
32. Aircraft Parking and Storage Requirements	Crack Seal / Slurry Seal and Restriping (2013 maintenance project). Strengthen Parking Apron pavement to 30,000 pound SWG design in designated Large Aircraft Parking Area.
33. Terminal Building Requirements	None.
34. Automobile Parking and Access Requirements	Install security lighting for Automobile Parking Area and Access Road. Crack Seal / Slurry Seal and Restriping (2013 maintenance project).
35. Airport Visual Aids	Extend Runway 4/22 MIRL and Taxiway MITL concurrent with Runway extension. Install Taxiway Guidance Signs as required. Install Distance Remaining signage on Runway 4/22. Relocate PAPI for runway extension.
36. Segmented Circle & Wind Cone	Install lighted Auxiliary Wind Cones at both runway ends.
37. Aircraft Fuel Service	None.
38. Fencing	Replace property line fencing with 7' chain-link.
39. Utilities	Upgrade electrical service as necessary for additional airfield lighting and visual aids.

GENERAL DEVELOPMENT PLAN - Gila Bend Municipal Airport - Gila Bend, Arizona
ULTIMATE TERM (2014-2023)

ITEM	RECOMMENDED IMPROVEMENT
40. Instrument Approaches and Navigational Aids	GPS Runway 4 approach (visibility minimums not less than 3/4 mile)
41. Primary Runway (Runway 4/22)	OPTION: Strengthen Runway 4/22 to 60,000 pound SWG design. OPTION: Crack Seal / Slurry Seal and Restriping (2018 maintenance project).
42. Crosswind Runway	None.
43. Taxiways	OPTION: Strengthen taxiway pavement to 60,000 pound SWG design. OPTION: Crack Seal / Slurry Seal and Restriping (2018 maintenance project).
44. Helicopter Operation Area	None.
45. Aircraft Parking and Storage Requirements	OPTION: Strengthen Large Aircraft Parking Area pavement to 60,000 pound SWG design. OPTION: Crack Seal / Slurry Seal and Restriping (2018 maintenance project).
46. Terminal Building Requirements	Expand the Terminal Building to a minimum of 875 square feet.
47. Automobile Parking and Access Requirements	Expand the paved Automobile Parking Area to accommodate a total of 23 cars. Crack Seal / Slurry Seal and Restriping (2018 maintenance project). Install expanded security lighting for new Automobile Parking Area.
48. Airport Visual Aids	Install REIL systems on Runway 4 and 22 approaches
49. Segmented Circle & Wind Cone	None.
50. Aircraft Fuel Service	None.
51. Fencing	None.
52. Utilities	Upgrade utility service as necessary for additional security lighting and Terminal Building expansion.